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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/891,165	06/26/2001	Shinichi Sato	P21149	1380

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EXAMINER	
HUNG, YUBIN	
ART UNIT	**PAPER NUMBER**
2625	

DATE MAILED: 10/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/891,165	SATO ET AL.	
	Examiner	Art Unit	
	Yubin Hung	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11 and 14-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11, 14-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

Response to Amendment/Arguments

1. This action is in response to amendment filed July 29, 2005, which has been entered.

2. Claims 1-10, 12 and 13 have been cancelled. Claims 111 and 14-22 are still pending.

3. Applicant's arguments, see page 14, lines 12-17 and page 15, 2nd paragraph of the response filed 07/29/05, with respect to the rejection(s) of claim(s) 11, 20 and 21 under35 U.S.C. 103 have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Andrew (US 6,804,402), Ramamurthy et al. (US 5,675,384) and Parker et al. (US 6,307,962). See below.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 11, 18, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrew (US 6,904,402), in view of Ramamurthy et al. (US 5,675,384) and Endoh et al. (US 4,652,935).

6. Regarding claim 21, and similarly claim 11, Andrew discloses

- transforming multi-bit image data into orthogonal transform coefficients [Fig. 2, ref. 200; Col. 6, lines 36-44]
- quantizing the orthogonal transform coefficients for each spatial frequency of the multi-bit image data [Fig. 2, ref. 201; Col. 6, lines 44-48. Note that alternative quantization methods can be used, as indicated in lines 46-48]
- generating a block of data, the block of data comprising the quantized data of each spatial frequency [Fig. 2, ref. 201; Col. 6, lines 44-48]
- rearranging the quantized data in the generated block of data so as to band the quantized data for each spatial frequency and so as to align the quantized data of a spatial frequency of the generated block of data with the quantized data of the same spatial frequency of the next generated block of data [Fig. 2, ref. 202; Figs. 5-8; Col. 6, lines 48-53; Col. 8, lines 22-67. Note that the DC component is in a band by itself. Note further that Figs. 7 and 8 show the alignment of the same band of data from all four blocks of the image shown in Fig. 6]

Andrew does not disclose expressly

- the spatial frequencies including a DC component, low frequency AC components, and high frequency AC components, a first number of quantization bits being assigned to the DC component, a second number of quantization bits being assigned to all the low frequency AC components, a third number of quantization bits being assigned to all the high frequency AC components, the second number of quantization bits comprising a multiple of the first number of quantization bits, and the third number of quantization bits comprising a multiple of the first number of quantization bits
- outputting, as bit serial data, the quantized data of the spatial frequency over a plurality of the rearranged blocks and coding the bit serial data using a coding system for facsimile

However, Ramamurthy discloses a quantization method that, for each block of coefficients, applies the same quantization step to all the coefficients. [See column 4, lines 14-16. Note that applying the same quantization step to both the DC and the AC coefficients implies that the same number of bits is allocated to each quantized coefficients. Since there is only one DC coefficient, the total number of bits allocated to all low-frequency (respectively, high-frequency) quantized AC coefficients is a multiple of the number of bits allocated to the quantized DC coefficient, irrespective of how low- and high-frequency coefficients are delineated.] In addition, Endoh discloses outputting data in bit planes (i.e., as bit serial data) and using a coding system for facsimile to encode them. [See Fig. 1; Fig. 3, refs. 11 (output bit serial data), 21-64 (facsimile encoding); Col. 2, lines 3-15; Col. 5, lines 3-44. Note that the quantized DCT coefficient block can be viewed as an image]

Andrew, Ramamurthy and Endoh are combinable because they are form the same field of endeavor of data compression.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Andrew with the teaching of Ramamurthy and Endoh by quantizing all coefficients from the same block with the same quantization step and encoding the series of the output data bits with a coding system for facsimile. The motivation would have been to support the maintaining quality of service while performing source quantization adjustment (as Ramamurthy indicated in Col. 31, lines 13-15), as well as to

support progressive encoding, which in turn supports progressive transmission of data, as Endoh indicated in column 1, lines 33-37 and column 1, line 66-column 2, line 2.

Therefore, it would have been obvious to combine Ramamurthy and Endoh with Andrew to obtain the invention as specified in claim 21.

7. Regarding claim 22, and similarly claim 18, it is rejected because given the encoding method of claim 21, it is obvious to obtain the corresponding decoding method by reversing the encoding steps of claim 21. [Note that the restoring step of claim 22 combines the reverse of the rearranging and the block generating steps of claim 21.]

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8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Andrew (US 6,904,402), in view of Ramamurthy et al. (US 5,675,384) and Endoh et al. (US 4,652,935) as applied to claims 11, 18, 21 and 22, further in view of Enokida (US 5,6087,862).

Regarding claim 14, the combined invention of Andrew, Ramamurthy and Endoh discloses all limitations of its parent, claim 11

The combined invention of Andrew, Ramamurthy and Endoh does not disclose expressly

- the coding system includes a JBIG coding system

However, Enokida teaches/suggests using a JBIG coding system. [See Fig. 1, ref. 5; Col. 3, lines 5-13.]

The combined invention of Andrew, Ramamurthy and Endoh is combinable with Enokida because they are form the same field of endeavor of image compression.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Andrew, Ramamurthy and Endoh with the teaching of Enokida by including a JBIG coding system. The motivation would have been because JBIG supports, among other things, various image display and browsing modes that can be particularly useful in Internet applications, as is well known in the art.

Therefore, it would have been obvious to combine Enokida with Andrew, Ramamurthy and Endoh to obtain the invention of claim 14.

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9. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrew (US 6,904,402), in view of Ramamurthy et al. (US 5,675,384) and Endoh

et al. (US 4,652,935) as applied to claims 11, 18, 21 and 22, further in view of Curry (US 5,710,636).

10. Regarding claim 19, the combined invention of Andrew, Ramamurthy and Endoh discloses all limitations of its parent, claim 11.

The combined invention of Andrew, Ramamurthy and Endoh does not disclose expressly

- a half-tone processor configured to half-tone process the multi-bit image data to obtain half-tone data
- a function selector configured to select the half-tone data when a facsimile transmission is selected, and to select the bit serial data when a copy operation is selected

However, Curry teaches/suggests processing the multi-bit image data to obtain half-tone data [Fig. 1, refs. 10-14]. In addition, it is obvious for a system that produces different types of data to be able to select among them for subsequent processing according to a certain processing logic (e.g., by an operator command).

The combined invention of Andrew, Ramamurthy and Endoh is combinable with Curry because they are form the same field of endeavor of image compression.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Andrew, Ramamurthy and Endoh with the teaching of Curry by generating half-tone data, adding the ability to select either the half-tone

data or the bit serial data to input corresponding to a function selecting signal for instructing an copy operation or facsimile transmission. The motivation would have been to be able to produce and compress input images to support different output means. (E.g., half-toning will allow a bi-level copier to produce copies that impart a grayscale appearance, as pointed out by Curry in Col. 1, lines 14-18).

Therefore, it would have been obvious to combine Curry with Andrew, Ramamurthy and Endoh to obtain the invention of claim 19.

11. Regarding claim 20, the combined invention of Andrew, Ramamurthy and Endoh teaches/suggests (per the analysis of claim 11)

- an orthogonal transformer configured to transform the multi-bit image data into orthogonal transform coefficients;
- a quantizer configured to quantize the orthogonal transform coefficients for each spatial frequency of the multi-bit image data;
- a block data generator configured to generate a block of data, the block of data comprising the quantized data of each spatial frequency;
- a frequency banding section configured to rearrange the quantized data in the
- generated block of data so as to band the quantized data of each spatial frequency and so as to align the quantized data of a spatial frequency of the generated block of data with the quantized data of the same spatial frequency of the next generated block of data, and to output, as bit serial data, the quantized data of the spatial frequency over a plurality of
- the rearranged blocks; and a coder configured to compress the bit serial data, using a coding system for facsimile communication

Andrew further teaches/suggests

- an printer configured to print the multi-bit image data [Fig. 1; Col. 5, line 35]
- a communicator configured to transmit the multi-bit image data [Fig. 1; Col. 5, lines 37-42]

and Curry further discloses/teaches

- an image inputting section configured to scan an original document and to obtain multi-bit image data
[Fig. 1, ref. 12; Col. 3, lines 39-41]

***

12. Claims 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andrew (US 6,904,402), in view of Ramamurthy et al. (US 5,675,384) and Endoh et al. (US 4,652,935) as applied to claims 11, 18, 21 and 22, and further in view of Imaizumi et al. (US 5,987,176).

13. Regarding claim 15, the combined invention of Andrew, Ramamurthy and Endoh discloses all limitations of its parent, claim 11

The combined invention of Andrew, Ramamurthy and Endoh does not disclose expressly

- an editor configured to edit the quantized data of the block of data generated by the block data generator, wherein the frequency banding section rearranges the edited quantized data

However, Imaizumi teaches/suggests rotating (i.e., editing) quantized data. [See Fig. 1, refs. A, b; Fig. 12, refs. 620, 623; Fig. 14, refs. S5-S7; Col. 6, lines 25-44; Col. 16, lines 50-65; Col. 18, lines 44-59]

The combined invention of Andrew, Ramamurthy and Endoh is combinable with Imaizumi because they have aspects that are from the same field of endeavor of image compression.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the combined invention of Andrew, Ramamurthy and Endoh with the teaching of Imaizumi by having a section that rotates (i.e., edits) the quantized data block. The motivation would have been to orient the image properly, if necessary, to improve down-stream processing. (For example, if a document consists of predominant vertical features, then rotate the document 90 degrees before applying an entropy encoding such as VLC for further compression can be beneficial.)

Therefore, it would have been obvious to combine Imaizumi with Andrew, Ramamurthy and Endoh to obtain the invention as specified in claim 15.

14. Regarding claim 16, Imaizumi further discloses

- a memory configured to store the quantized data of the block of data generated by the block data generator
  [Fig. 12: ref. 610]
- wherein the editor rotates the quantized data by controlling a write address and a read address of the memory based on a control data, the control data indicating a rotation amount and a rotation direction
  [Fig. 12, refs. 611, 622, 623; Col. 16, lines 51-65]

15. Regarding claim 17, the combined invention of Andrew, Ramamurthy, Endoh and Imaizumi discloses all limitations of its parent, claim 16.

The combined invention of Suzuki, Andrew, Yanagihara and Imaizumi does not disclose expressly

- the editor further adds rotation information to rotated quantized data for each page, the rotation information indicating the rotation amount and the rotation direction for each page

However, **Official Notice** is taken that at the time of the invention, it would be obvious to one of ordinary skill in the art to modify the combined invention of Andrew, Ramamurthy, Endoh and Imaizumi by adding rotation information to rotated quantized data for each page. The motivation would have been to provide down-stream processor necessary information to reconstruct the pages.

Conclusion and Contact Information

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Wu et al. (US 6,700,933) – discloses a progressively fine-granularity scalable video coding that encode on a bit plane-by-bit plane basis

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (571) 272-7451. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Yubin Hung
Patent Examiner
October 4, 2005

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